

outer and one inner; finger a little more than twice the length of the underhand.

Legs with granularly crested femora; the feet with two rows of hairs below.

Pectinal teeth 21.

Genital operculum considerably longer than sternum.

Measurements in millimetres. Total length 31; length of carapace 3.5, of tail 17.5; length of movable digit 3.

Loc. North-west Somaliland (Berbera or Hargaisa). A single specimen (type) in the British Museum.

In size and some points of structure this little *Buthus* approaches *Nanobuthus andersoni* Poc., obtained at Duroor to the north of Suakim (Journ. Linn. Soc., Zool. xxv. p. 314). The dentition of the mandible and of the digits of the chelæ, however, is quite normal for the genus *Buthus*. The most striking structural peculiarities of the species are: (1) the obsolescence of all the cephalothoracic keels with the exception of the anterior median; (2) the coarse but sparse punctuation of the last sternite and of the lower side of the first caudal segment, accompanied as it is by the disappearance of the median keels; (3) the disappearance of the median keels on the lower side of the 4th caudal segment. These characters do not co-exist in any species known to me. Judging from the structure of the inferior lateral keels of the 5th caudal segment and of the inferior keels of the 2nd and 3rd segments, this species belongs to the same category as *B. occitanus*.

10. GENERAL LIST OF THE SCORPIONS OF SOMALILAND AND THE BORAN COUNTRY. By R. I. POCOCK.

Family BUTHIDÆ.

Genus UROPLECTES Peters.

UROPLECTES FISCHERI (Karsch).

Lepreus fischeri, Karsch, Mitth. Münch. ent. Ver. iii. p. 124 (1879).

Loc. Barawa (*Karsch*), Turfa and Lummo (*Donaldson Smith*), and Berbera and Hargaisa (*C. V. A. Peel*).

To the south of Somaliland the typical form of this species is replaced by two subspecies, one paler, the other darker than *U. fischeri typicus*. The three may be contrasted as follows:—

- | | |
|---|-------------------------------|
| a. Hands entirely pale, body banded above as in <i>fischeri typicus</i> | <i>f. flavimanus</i> , subsp. |
| b. Hands wholly black or at least lined with black and black at base of fingers. | [nov.] |
| a'. Terga yellow, with a pair of black spots; carapace and terga broadly yellow at the side ... | <i>f. typicus</i> . |
| b'. Terga mostly black, with a narrow median and lateral marginal band, much less yellow at side of carapace..... | <i>f. nigrimanus</i> . |

The subspecies *nigrimanus* was based upon a single example from Mombasa (see Proc. Zool. Soc. 1890, p. 130, pl. xiv. fig. 2). *U. flavimanus* is based upon a specimen in the British Museum obtained by Mr. J. Wilson at Mombasa in British East Africa.

It is interesting to note that the two subspecies most distinct from each other, namely, *U. f. flavimanus* and *U. f. nigrimanus*, occur in the same locality, whereas the subspecies intermediate between them is found elsewhere.

Genus PARABUTHUS Pocock.

PARABUTHUS GRANIMANUS Pocock.

Parabuthus granimus, Pocock, Journ. Linn. Soc., Zool. xxv. p. 311 (1895).

Loc. Zeyla in North-west Somaliland (*E. W. Oates*), Goolis Mountains (*Lort Phillips*). In the British Museum.

PARABUTHUS HETERURUS Pocock.

Parabuthus heterurus, Pocock, in Donaldson Smith's 'Through Unknown African Countries,' p. 402 (1897).

Loc. Hargaisa, Silul, Shebeli River (*A. Donaldson Smith*); Goolis Mountains (*E. Lort Phillips*). In British Museum.

The two species of this genus may be recognized as follows:—

- | | |
|--|------------------------|
| a. Hand and brachium closely granular; 5th segment of tail strongly infuscate at least below | <i>P. granimanus</i> . |
| b. Hand and brachium smooth, punctured, hairy; 5th caudal segment clear yellow throughout, 4th segment and vesicle black | <i>P. heterurus</i> . |

Genus BUTHUS Leach.

BUTHUS OCCITANUS (Amoreux), subsp. nov. BERBERENSIS.

Colour yellow, with black lines along the keels of the upperside of the trunk, humerus, brachium, and hand, also the distal half of the femora infuscate and the base and keels on the patellæ. *Body* and *tail* crested and granular as in the typical form, the granules of the inferior keels of the 2nd and 3rd caudal segments about as much enlarged as in the Spanish form; external surface of hand with a few granules, a pair of strong granular finger-keels running along its upperside and inner edge.

Total length 38 mm.

Somaliland (*Miss Gillett*). In British Museum.

Subsp. nov. ZEYLENSIS.

Colour a uniform reddish yellow, the appendages and tail clearer than the trunk. Frontal intercarinal area of *carapace* covered with granules; a median row of granules running along

the middle of the ocular tubercle. *Terga* closely and finely granular throughout. Inferior keels of 2nd and 3rd *caudal segments* strongly dentate. *Hand* smooth, with a pair of weak and weakly granulate crests on its upperside.

Total length 50 mm.

Loc. Zeyla in North-west Somaliland (*E. W. Oates*). In British Museum.

BUTHUS CALVICEPS Poc.

Cf. supra, p. 54.

BUTHUS ACUTECARINATUS Simon.

Buthus acutecarinatus, Simon, Ann. Mus. Genova, xviii. p. 245, pl. viii. fig. 18 (1883).

Loc. Zeyla (*E. W. Oates*). In British Museum.

Occurs also in Egypt and Arabia.

BUTHUS POLYSTICTUS Poc.

Buthus polystictus Pocock, Ann. Mag. Nat. Hist. (6) xviii. p. 178, pl. xi. fig. 1 (1896).

Goolis Mountains in Somaliland (*E. Lort Phillips*). In British Museum.

BUTHUS EMINI Pocock.

Buthus eminii, Pocock, Ann. Mag. Nat. Hist. (6) vi. p. 98 pl. i. fig. 2 (1890); *id.* op. cit. (6) xviii. p. 179 (1896).

Loc. Aimœa in the Boran Country, 3000 ft. (*A. Donaldson Smith*). In British Museum.

This species and perhaps also *B. polystictus* may prove to be subspecies of *B. trilineatus* Peters, described from Tete.

The species and subspecies of *Buthus* mentioned above may be diagnosed as follows:—

- a.* Inferior lateral keels of 5th caudal segment posteriorly lobate; inferior median keels of 2nd and 3rd with the granules enlarged towards the posterior end.
- a*¹. Carapace without distinct median, lateral, and posterior keels, inferior keels on 4th caudal segment obsolete *calviceps*.
- b*¹. Carapace with distinct median posterior and lateral keels, the posteriors turning outwards and uniting with the laterals, inferior keels on 4th caudal segment developed *occitanus*.
- a*². Legs, chelæ, and body uniformly yellow, not lined with black; intercarinal ocular area closely granular subsp. *zeylensis*.
- b*². Chelæ and body with black-lined keels, femora of legs distally infusate; patellæ also infusate basally and along keels; frontal area of carapace sparsely granular in the middle subsp. *berberensis*.

- b. Inferior lateral keels of 5th caudal segment and inferior median of segments 2 and 3 uniformly granular throughout.
- a*³. Hand carinate and densely granular; dorsal abdominal keels posteriorly strongly spiniform. *acutecarinatus*.
- b*³. Hand smooth, not carinate; dorsal abdominal keels not strongly spiniform posteriorly.
- a*⁴. Less coarsely granular; tail thinner and lower, height of 4th segment barely half its own length and distinctly less than length of 1st; upper surface of caudal segments much less strongly excavated, &c. *polystictus*.
- b*⁴. More coarsely granular; tail thicker, its superior keels more strongly elevated; height of 4th segment more than half its length and equal to length of 1st *emini*.

Family SCORPIONIDÆ.

Genus PANDINUS Thorell.

PANDINUS MEIDENSIS Karsch.

Pandinus meidensis, Karsch, Mitth. Münch. ent. Ver. iii. p. 127 (1879); Kraepelin, Das Tierr., Scorpiones, &c. p. 119 (1899).

Loc. Meid in Somaliland. In Berlin Museum.

PANDINUS SMITHI (Pocock).

Scorpio smithi, Pocock in Donaldson Smith's 'Through Unknown African Countries,' p. 198 (1897).

Loc. Hargaisa, Silul, Abdeh, and Turfa in Somaliland (*A. Donaldson Smith*). In British Museum.

PANDINUS PALLIDUS (Kraepelin).

Scorpio pallidus, Kraepelin, Mitt. Mus. Hamburg, xi. p. 60 (1894).

Pandinus pallidus, id. Das Tierr., Scorpiones, &c. p. 120 (1899).

Loc. Barawa in Somaliland. In Hamburg Museum and British Museum.

The typical form of this species was based upon immature individuals measuring only up to 75 mm. long. Until the adult is known it seems to me impossible to classify the species with certainty. It is undoubtedly nearly allied both to the following species, *P. phillipsi* from North-west Somaliland, and to the more southern Masailand form *P. gregorii*, but it will probably prove to be at all events subspecifically different from both.

PANDINUS PHILLIPSI (Pocock).

Scorpio phillipsii, Pocock, Ann. Mag. Nat. Hist. (6) xviii. p. 101 (1896).

Pandinus phillipsii, Kraepelin, Das Tierr., Scorpiones, &c. p. 120 (1899).

Loc. Dooloob and the Goolis Mountains, inland of Berbera (*E. Lort Phillips*). In British Museum.

This form is evidently allied to the typical *P. pallidus*; but until adults of the latter come to hand for comparison, it is impossible to say what the exact relationship between the two may be. The original examples of *P. phillipsi* are a pair of females obtained at Dooloob. Mr. Lort Phillips subsequently procured an adult male and a young female on the Goolis Range of mountains. The former has 17-18 pectinal teeth, a longer tail and larger vesicle than the female, and lobate movable finger on the chela. The young one is as large as a co-type of *P. pallidus*, the carapace in the two measuring 11 mm. Moreover the posterior tarsal lobe is tipped above with bristles as in *P. pallidus*, not with a spine as in the adult *P. phillipsi*. But the shape of the hand in the young *P. phillipsi* is different, this organ being very noticeably narrower, and the tubercles on its upperside are much sharper and more strongly defined.

The following actual measurements (in millim.) of the two examples may be advantageously compared:—

	Total length (without vesicle).	Carapace.	Length of brachium.	Length of underhand.	Length of movable finger.	Width of hand.
Young of <i>P. pallidus</i> .	71	11	7.5	7	11	10
Young of <i>P. phillipsi</i> .	68	11	7.5	7	11	8.5

As will be seen, there is practical identity of measurements¹ except where the width of the hand is concerned.

PANDINUS COLEI (Pocock).

Scorpio coleii, Pocock, Ann. Mag. Nat. Hist. (6) xviii. p. 180, pl. xi. figs. 2, 2 a (1896).

Pandinus coleii, Kraepelin, Das Tierr., Scorpiones, &c. p. 120 (1899).

Loc. Berbera and Goolis Mountains (*E. Lort Phillips*). In British Museum.

This species was based upon a subadult specimen from Berbera.

Mr. Lort Phillips subsequently procured in the Goolis Mountains and kindly sent to the British Museum three additional examples, an adult male and female and a young specimen considerably smaller than the type. The characters upon which the species was based prove perfectly constant. The adult male and female are much alike; the former, however, has the terga of the abdomen finely and closely granular posteriorly, whereas in the female they are nearly

¹ The difference in total length in this and in many other cases is due to the degree of distension of the abdominal region. The length of this region is so very liable to alteration in accordance with the mode of preservation of the specimen after death, and depends so largely upon the fasting or full-fed, pregnant or not pregnant condition of the Scorpion, that the relative lengths of the tail as compared with the trunk, which Kraepelin, Karsch, and others so frequently quote, have but little importance. The length of the carapace, which does not vary, should be taken as standard for comparison.

smooth. Again, the 2nd and 4th abdominal sterna are finely granular in the middle; and, lastly, the vesicle is more strongly inflated, its width considerably exceeding its height and being equal to that of the 4th caudal segment.

In the female the width of the vesicle is scarcely greater than its height and less than the width of the 5th segment.

Pectinal teeth 11-13 (♂ ♀).

Total length (♂) 82 mm., carapace 13.5, tail 38, underhand 8.5, width of hand 12.

PANDINUS PEELI Pocock.

Cf. supra, p. 53.

PANDINUS HAWKERI, sp. n.

Colour of carapace and palpi yellowish brown; tergal plates and tail reddish brown; vesicle brown with yellow lines; legs entirely pale yellow, abdominal sterna testaceous.

Carapace smooth, polished; terga also smooth, punctured along the posterior margin, the last very weakly granular laterally, the crests obsolete. *Sterna*, with exception of the last, smooth; the last obsoletely crested, but mesially closely granular.

Tail short, only a little more than two and a half times the length of the carapace, which is almost as long as its first three segments; the inferior median keels absent on segments 1-5, the inferior laterals present, smooth on segments 1 and 2, granular on 3 to 5, the area of the lower surface of the tail between them granular as in *P. colei*; superior and superior-lateral keels of tail weak, punctured, but not granular; sides of tail smooth; upper surface at most very sparsely granular, except along the posterior edge of segments 1-4, where there is a series of denticuliform granules; *vesicle* strongly punctured and setose beneath, but scarcely granular, its width exceeding its height. *Chelæ*: humerus smooth below and behind, the crests on its upper and anterior surfaces coarsely granular, its upperside sparsely granular in the basal half; brachium smooth, except for some minute granules in front and some coarser ones along the anterior inferior crest: hand moderately wide, its width equal to three-fourths the length of the carapace; upper surface granular on the external slope above the strong keel of the underhand; the rest of the upper surface nearly smooth and polished, beset with a fine reticulation of ridges which are almost obsolete in adult, coarser in young; inner edge almost smooth, punctured, lower surface sparsely and weakly granular towards the base of immovable digit; immovable digit with its basal width less than half the length of its biting-edge; movable digit shorter than carapace, exceeding width of hand, equal to length of 3rd and 4th caudal segments.

Legs smooth; protarsi of 1st and 2nd with one posterior apical spine; tarsal lobes with two spines; lower surface of tarsi with one anterior and three posterior spines; anterior claw much

weaker than posterior. *Sternum* long, about one-third longer than wide.

Pectinal teeth 12-15 in ♀.

Measurements in millimetres. Total length 81, carapace 15, tail 50; width of hand 12; length of movable digit 13, of hand-back 8.

Loc. Jifa Uri inland from Zeyla (*R. M. Hawker*). In British Museum.

Differing from *P. colei* and *P. peeli* in the characters pointed out below (p. 62).

PANDINUS PUGILATOR Poc.

Cf. supra, p. 52.

PANDINUS MILITARIS, sp. n.

Scorpio bellicosus, L. Koch; Pocock, in Donaldson Smith's 'Through Unknown African Countries,' p. 397 (1897) (nec *P. bellicosus* L. Koch).

♀. *Colour* yellowish brown; legs paler yellow, hand reddish brown with black fingers. *Carapace* granular laterally, entirely smooth above except for a few granules in the antecular groove. *Terga* finely granular laterally. *Tail* a little more than two and a half times as long as the carapace, the inferior keels on segments 1-3 quite smooth, those on 4th at most slightly rugose; superior and superior-lateral keels of all the segments granular or weakly denticulated; superior surface of 1st granular, of 2nd less so; width of 1st exceeding length of 3rd, almost equal to that of 4th; 5th about twice as long as wide. *Chelæ*: *humerus* granular above at least on its basal half, smooth below; *brachium* almost entirely smooth, its anterior side weakly granular above, more coarsely below; *hand* wide, its width in adult exceeding length of 3rd and 4th caudal segments, inner edge smooth, upper surface smooth, finely reticulated, a few low tubercles just above the keel of the underhand and at the base of the immovable digit; external portion of upper surface rising vertically above keel of underhand; thickness of hand at the front equal to length of 4th caudal segment. Lower side of hand granular distally, scarcely crested.

Pectinal teeth 12-15.

Measurements in millimetres (of type). Total length 112, carapace 19, tail 51; width of hand 16·8, underhand 10·5.

Loc. Aimola in the Boran Country (*Donaldson Smith*); also Ndi, on the Weiss Road inland from Mombasa (*C. Stuart Betton*). In British Museum.

Nearly allied to the East-African species *P. cavimanus*, but differing in the following characters:—the carapace in the female is longer than the 4th and 5th caudal segments, and the basal width of the immovable finger is only about half the length of its free margin; whereas in *P. cavimanus* (♀) the carapace is shorter than 4th and 5th caudal segments, and the basal width of the immovable digit is about two-thirds the length of its free margin.

I at one time supposed this species to be the female of the Abyssinian *P. bellicosus* L. Koch, but judging by Kraepelin's recent diagnosis of the latter species (Das Tierr., Scorpiones, p. 121, 1899), *P. militaris* certainly differs in having the superior caudal keels denticulated, the hand finely punctulate above and below, and the last abdominal sternite scarcely visibly crested.

Synopsis of the Somali Species of Pandinus.

- a.* Median eyes always some distance behind middle of carapace; tarsi more numerous spined, the lobes with 3-4 spines, total number on lower side of tarsi 9 behind, 6 in front.
- a*¹. Tarsal lobes with 4 spines, a strong spine being on the tip of the lobe; humerus of chela furnished below with two short rows of denticles..... *meidensis.*
- b*¹. Tarsal lobe with 3 strong spines, the spine on the tip smaller and usually filiform distally; humerus of chela smooth below.
- a*². Ornamentation of hand consisting of conical tubercles; inner margin of hand distinctly tubercular and denticulate from base of finger to carpal articulation, width of hand greater than length of carapace; pectinal teeth 18-21 *smithi.*
- b*². Ornamentation of hand consisting of low rounded or irregular shaped, often anastomosing tubercles; lobe of hand with smooth posterior edge; length of carapace exceeding width of hand; pectinal teeth 15-18 *philipsi.*
- b.* Median eyes in middle of carapace, rarely a little behind the middle; total number of spines on tarsi 5 behind, 3 in front, 2 only being situated on each lobe, the tip of which is furnished with bristles.
- a*³. Lower surface of all the caudal segments and the middle of at least the last abdominal sternite closely granular and not keeled.
- a*⁴. Upper surface of hand from inner edge to crest of underhand uniformly covered with coarse granules which do not anastomose; upper crest of brachium distinctly granular *colei.*
- b*¹. Upperside of hand coarsely granular only above crest of underhand, the rest of its upperside either almost smooth or ornamented with low rounded tubercles which run into ridges; upper crest of brachium quite smooth.
- a*⁵. Upperside of hand covered with ornamentation of low, more or less anastomosing tubercles; its lower surface distinctly granular; hand larger, carapace equal to length of underhand + one-third of movable digit, and only as long as the hand from the posterior edge of the lobe to the base of the immovable finger; immovable finger not twice as long as its basal width *peeli.*
- b*⁵. Upperside of hand smooth, at most ornamented with a network of low ridges, lower side very sparsely granular; hand smaller, carapace as long as underhand + half the movable finger, and as the hand measured from the posterior edge of the lobe + half the immovable finger; immovable finger twice as long as its basal width. *hawkcri.*

